

Observations in Urban Agriculture from
Europe and the United Kingdom, and how
these relate to a New Zealand context in order
to help create a more sustainable future.

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*Churchill Fellow Carl Pickens (left) enjoying a meal
with the Urban Farming Collective - CityPlot Amsterdam*

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Executive Summary

He aha te mea nui o te ao. He tāngata, he tāngata, he tāngata

What is the most important thing in the world? It is people, it is people, it is people.

Acknowledgement

Firstly, a big thank you to the Winston Churchill Memorial trust for recognizing the importance of this work, and the role it can play in strengthening local communities and building resilience in the face of climate change and (currently), a global pandemic.

In mid-2019 I travelled to Germany, France, Holland, Belgian, England, Norway and Denmark to investigate Urban Agriculture. The purpose of this trip was to explore how Urban Agriculture projects function in Europe, how they are contributing to a sustainable food infrastructure, how they are benefitting the environment and their local communities, and how this might work in a New Zealand context. A wealth of information was gathered and has been documented in this report, and is being shared with architects, landscape architects, planners, sustainability advisors, community groups, and local councils around New Zealand today.

I'd like to also say a huge thanks to all the gardeners, agronomists, researchers, academics, and community facilitators who so generously gave me their time, showed me their farms and gardens, invited me to stay, and pointed me in the right direction when the next steps seemed vague at best. I know I've made lifelong friends and met people with whom I will continue to share knowledge, as we work to ensure the best models of Urban Agriculture are implemented here in Aotearoa, New Zealand.

Introduction

In densely populated cities across Europe and America urban agriculture is a rapidly growing field of practice and research. The European Cooperation for Science and Technology (COST) undertook a detailed study between 2012-2016 to seek a deeper understanding of Urban Agriculture in Europe. 'It proved to be the case that Urban Agriculture is far more than just food production in the city. A comparison with other global regions showed that in Europe, the metalevel benefits of Urban Agriculture are more important than pure production. The urban development domain seldom uses food as a target on its own-but mostly as a tool to achieve other non-production orientated goals' (Lohrburg, 8, 2016).

Such non-production orientated goals can be broad ranging, and were clearly evident in the projects I visited. One example is recycling food waste. According to data by Love Food Hate Waste, New Zealanders throw out 150,000 tonnes of food a year. Because this decomposes in the absence of oxygen it produces methane. If food waste was a country it would come 3rd behind China and the United States in terms of carbon emissions (as stated on the Love Food Hate Waste website). Other non-production orientated benefits include the consumption of fresh vegetables leading to positive health outcomes, gardens intercepting and slowing stormwater runoff (preventing flooding events) , reduced food miles, and a reduction in pollution via plants removing harmful particulates from the air.

In the article 'Paris Pastoral, a City Recultivated', writer Mira Kamdar refers to the January 2019 Paris exhibition 'Agricultural Capital: Projects for a Cultivated City', "where an array of architects, urban planners, geographers, agronomists, and farmers argue that the only way for the metropolitan Paris to survive the environmental calamities and social inequities, including

global warming and a sharply divided metropolis that includes some of the richest and many of the poorest people in France, is to embrace 'Agricultural Urbanism'." Mira goes on to say "whereas 'Urban Agriculture' may include high-tech farm towers, computer-monitored, hydroponically grown tomatoes or micro-irrigated salad beds on supermarket rooftops, Agricultural Urbanism' argues for the transformation of the metropolitan into a porous, diverse, interactive habitat where agriculture permeates the experience of the people, plants, and animals that live there". In his remarks at the opening of the same exhibition, Jean-Louis Missika, the deputy mayor of Paris, put the stakes more bluntly, declaring: "The new urbanism will be agricultural or it will not *be*."

Under the shadow of the Global Financial Crisis in 2008, the 136th Council meeting of the FAO (Food and Agricultural organization of the United Nations) reported that "*World hunger is projected to reach a historic high in 2009, with 1,020 million people going hungry every day (up from 850 million in 2007). The urban poor will probably face the most severe problems in coping with the global recession....*". Furthermore, in the 'Comprehensive Framework for Action in response to the global food crisis' (UN, 2008) the UN stated that "*Any long-term strategy to reduce the pressure on food prices will also need to encompass more effective strategies to promote sustainable urbanisation. A paradigm shift in design and urban planning is needed that aims at: (.....) Reducing the distance for transporting food by encouraging local food production, where feasible, within city boundaries and especially in immediate surroundings. Without sacrificing core principles to observe public health standards, this includes removing barriers and providing incentives for urban and peri-urban agriculture, as well as improved management of water resources in urban areas.*

That was then and this is now. At the time of writing we face a similar and likely more serious situation with economies around the world reeling via the impact of Covid-19. During

the April 2020 lockdown in New Zealand, Christchurch city-missioner reported a 3-fold increase in food parcel demand, while Wellington's city mission saw a 400% increase in demand. Auckland Council meanwhile transformed Spark arena into a giant food-bank.

Food insecurity is not a new problem in New Zealand. The 'Household Food Insecurity Among Children': New Zealand Health Survey Published in June 2019 by the Ministry of Health and conducted by CBG Health Research Ltd, found that in 2015/16 there were just over 917,000 children aged 0–14 years in New Zealand. Of these children almost one in five lived in a household that experienced severe-to-moderate food insecurity. The report also showed children in food-insecure households have worse indicators in terms of health, development and access to health services. Their parents are more likely to report psychological distress and stress related to parenting.

The way in which Urban Agriculture is been integrated into increasingly dense populated cities in New Zealand has historically been ad-hoc at best. Urban Agriculture is just starting to be recognised for its potential benefits and gain some momentum in New Zealand. There is however little existing policy to promote or prioritise Urban Agriculture in New Zealand, though Christchurch Council with its Food Resilience Policy is one exception. It aims to make council land available for food production and has the ambitious goal of Christchurch being the best edible garden city in the world. It has been successful in enabling the growth of Urban Agriculture in the city.

This Fellowship will seek to explore the following questions: What will increasingly dense cities and built forms look like when we start to habitually design them around a sustainable food infrastructure?, how might this look in a New Zealand context?, and how are established projects and policies in Europe benefiting the environment and their local communities?

Key Learnings Summary

Collaboration. This fellowship has allowed a deeper understanding of the benefits of collaboration in Urban Agriculture, something the Europeans do well. Collaboration between private industry, councils, government, and growers, is common. Each plays a role to ensure the essentials of land, structural framework, and seed funding is in place so projects can establish more easily. Land is made accessible, as in the case with La Paysan Urbaine, Marseille and their leasing of land off a local Monastery, or the municipality in Andernach, Germany who enable public space to be used for food production. Structural framework is put in place, as in the case with the Parisculteurs policy initiative in Paris - which has improved food security for the urban poor, or the 'Association' framework in Marseille, which has seen Urban Agriculture projects become more profitable. Seed funding is provided, as in the case of private enterprise funding the PAKT rooftop farming initiative in Antwerp, or the Realdania fund at OsterGro Copenhagen, which provided money for initial farm infrastructure.

Diversity. A diversity of activities within a project was commonplace in Europe, and typically enabled financial resilience. In particular the combining of Urban Agriculture with hospitality (e.g. restaurant / cafe / bar) was commonplace. This increased the visibility and legibility of Urban Agriculture (as in the case of a discussion before the restaurant meal at OsterGro, Copenhagen), and in many cases was fundamental to the economy of a project. Furthermore a massive investment in building infrastructure was not always necessary to enable restaurant type activities, as dining often occurred inside relatively inexpensive glasshouse-type structures, or outside using upcycled furniture.

European projects often saw a combination of the following activities: CSA (community supported agriculture), skills training for the long term unemployed, restaurant and bar, education and workshops, venue hire, garden allotment hire, and produce for sale.

Social Insertion. A social insertion aspect was common and often the first priority of a project. This often took the form of assisting the long-term unemployed with new skills and eventual full-time work, with a government or city municipality providing financial support. In the case of Pierre Mendez France School in Paris, preventing young students from leaving school early was a focus, and one in which they are having considerable success. It is an example of how effective Urban Agriculture can be at changing lives. In fact all projects I visited were making a significant contribution to community resilience and social cohesion.

Top down, bottom up. I observed projects succeeding due to a policy driven financially-enabled top down approach, and also a community-led grass roots bottom up approach. In the case of Incredible Edible Todmorden England, a grass roots movement has had huge success, led to the revival of a local economy, and influenced councils all over the UK. For example Incredible Edible Todmorden is currently working with Calderdale council on the development of an edible 'corridor' of community food growing space from Todmorden to Halifax in Yorkshire, England.

Art and culture. Using art and culture to educate regarding ecology and growing food was an interesting finding. This was an aspect of most of the projects I visited, be it the use of theatre, sculpture, music, craft - e.g. creative upcycling, or even dance to inform and engage. Europeans are known for their celebration of culture and I observed this creativity help engage with a sector of society that might not otherwise be interested in Urban Agriculture.

Succession. Urban Agriculture projects have been known to fail for many reasons, not least due to the over-reliance on one individual who burns-out or leaves. In the case of PLUK rooftop farm in Antwerp, this is being future-proofed by paying it forward, or passing on skills. It's an approach that makes for a far more sustainable project going forward.

Application to NZ projects. The experience gained in this Fellowship has broadened my perception of what's possible within an Urban Agricultural context. Key learnings will be applied to a Manukau Urban Maori Authority (MUMA) project at land adjacent Nga Whare Waatea Marae in Favona, Auckland. The development of a 3-5 acre market garden and education centre aims to provide food security for the local community - an issue that was heightened during the Covid-19 April 2020 lockdown when the Maraes' foodbank was overrun. We will be exploring a diverse approach to generating income, as is typical of European Urban Agriculture models.

I am working with Kelmarna City Farm in Grey Lynn, Auckland, on the expansion of its farming area and the potential integration of a dedicated café/restaurant facility. The aim is to help the farm gain more economic independence, and is inspired by European models which seamlessly integrate hospitality and Urban Agriculture.

I am working with Kaipatiki Project and Auckland Council on the development of a new environment centre, food production area / teaching garden, and expanded native nursery at Lauderdale Reserve, Auckland. A presentation to Kaipatiki Project on Fellowship learnings will explore how European models of operating might be applied to the new centre. This is particularly relevant during a time of Covid-19 when existing funding models are unclear and under threat.

I am also working with Kaipatiki Project and the NZ Government housing agency, Kainga-Ora on the development of a new environment centre, community nursery, and community orchard in Hobsonville Point, Auckland.

Presentations: A Presentation of key learnings is planned for the following organisations in New Zealand through the latter half of 2020; Auckland Council Energy and Sustainability Specialists (contact: Duncan Munro); New Zealand Institute of Architects (contact: Phillip Kennedy); New Zealand Institute of Landscape Architects; Urban Agriculture organisations in Auckland including Kelmarna City Farm and For The Love of Bees / O.M.G (Organic Market Garden); and others. The purpose of these presentations is to share key learnings and spark conversations regarding the myriad potential benefits of Urban Agriculture in terms of economy, tourism, social cohesion, and employment.

Conclusion

New Zealand cities do not have the same kind of pressure in terms of population density and a lack of green space that has been a catalyst for the growth of Urban Agriculture in many European cities. We do however have problems related to poverty, food security, poor nutrition, a high carbon footprint (fifth highest in the OECD), food waste (with resultant emissions), and access to land on which to grow food (particularly a lack of affordability). Councils and municipalities can, through policy initiatives, help alleviate these problems by making available public land, buildings, and funding for Urban Agricultural initiatives; not to mention providing people with opportunities for new skills, jobs, and income. Similarly, private industry - be it developers, planners, architects or landscape architects - all play a role in helping ensure Urban Agriculture, or 'Agricultural Urbanism' becomes part of the ongoing narrative; where, as Mirar Kamdar puts it, the city becomes "a porous, diverse, and interactive habitat where agriculture permeates the experience of the people, plants, and animals that live there".

A 'Local Plan' adopted in 2017 by Calderdale Council - the local authority within which Incredible Edible Todmorden (England) resides - contains specific policy related to Urban Agriculture, namely: 'All new residential developments with the exception of apartments and specialist accommodation shall include gardens or communal areas of adequate size, commensurate in scale with the development, to support household food production. Furthermore, all developers will be encouraged to explore ways to incorporate food growing into landscaping schemes and the spaces around their developments.' This is a good example of how a policy initiative can effect positive change.

Similarly, 'Northern Roots', a proposal to develop the UK's largest urban farm and eco-park on 160 acres of land near Bolton, Manchester, is leading the way. The proposal is to develop an urban farm with associated forest schools, education and events, weddings, glamping, a micro-brewery, and outdoor sporting activities such as mountain biking. The 25 million pound project which is just getting underway has been called, the 'Eden of the North'.

It became clear on my travels and in numerous discussions with growers, academics and social workers, that Urban and Peri-Urban Agriculture provides an important safety net in periods of food and economic crises, and is also an essential element in building sustainable and healthy cities. If we are to thrive in coming years, when the combined effects of Covid-19 and climate change are upon us, with all their resultant environmental and social inequities, then we owe it to ourselves to ensure urban design and planning restores the essential place of small-scale, ecologically sustainable agriculture to our cities and towns.

Key Learnings / Project by Project (1-14)

1. Kindness, community, and reviving a local economy:

Todmorden, Yorkshire, England.

Incredible Edible Todmorden was established in 2007 in the historic market town of Todmorden, West Yorkshire, population 17,000. In 2008, local residents led by Pamela Warhurst and Mary Clear came up with an idea in response to concerns over climate change, food sustainability, and disenfranchised community. They developed the Incredible Edible model which revolves around a metaphor of three 'spinning plates'. The first plate: 'community' refers to growing food in public spaces. Anyone can harvest this food with the intent to help transform peoples' relationship to their environment and surroundings. The second plate: 'business' relates to supporting local food businesses, e.g. producers, distributors, and restaurants. The goal of this plate is to strengthen local economy through things like vegetable tourism and the Incredible Edible Todmorden (IET) brand as an income generator. The third and final plate is 'learning'. The idea of this plate is to embody the first two plates by way of education and passing on skills. Since its emergence the Incredible Edible idea has spread to hundreds of communities. Today there are 120 official Incredible Edible groups in the UK, and over 700 worldwide.



Mary Clear with the Todmorden Mayor in 2019



Beautiful Todmorden town

I toured Todmorden with Estelle Brown, a key member of the IET community. She told me "when we started we wouldn't ask permission from anybody, we'd just do stuff...we only take ugly places and transform them, we won't dig up a lawn in a public park for example because people wouldn't like that".

IET began by removing privet hedges in public spaces and replacing them with herbs and perennials like artichokes. The local council wasn't on side initially but they turned a blind eye, now they are supportive - not least because they could see visitors and money flowing into the town and empty shops opening up again.

IET pay for everything themselves, they don't take council money or award funding. They originally took grants but stopped in 2010 because they witnessed other organisations dependant on funding collapse when funding stopped. Now they get by with donations and payments for speaking engagements and tours. As of 2019 there were 378 volunteers on the IET list and 30 to 75 come every Sunday to help maintain the edible beds around town.

There are many innovative and inspiring IET stories...here's a few:

Benches: Council removed benches that didn't have memorial plaques attached (in an effort to stop undesirable loitering). IET didn't agree with this so they built their own benches and bolted them to the ground. You have to admire their tenacity.

Pollination Street: Mary phoned council to say there was a street sign missing (Pollination Street), and could they please send a replacement. Nobody checked to see if the street actually existed. The sign was sent and now it adorns one of IET's more impressive gardens.



An Incredible Edible Todmorden Bench



Pollination Street, a garden bed full of edibles

Drugs and alcohol: Todmorden had a drug and alcohol problem. An area by the canal was used by people who would leave needles, bags and empty bottles in garden beds. IET tidied up these beds and planted them out. People still congregate but don't leave litter anymore.

Protest: Two derelict buildings in Todmorden were falling down. Asda, a supermarket chain, owned the land and was planning to demolish the buildings and build a supermarket. It didn't happen. IET, tired of this eyesore asked council to do something but again nothing happened, so IET initiated a protest. They erected a sign saying 'Azda are pants and if you agree Azda are pants put your clothes on this clothesline'. IET built two washing lines which quickly filled with knickers from people all over town. BBC North news was contacted and told 'something strange is happening in Todmorden, people are putting their knickers up all over town'. Azda was so embarrassed by the resulting media attention that by the end of the month Estelle got a call saying 'don't worry we'll take down the buildings, put up fences, and build you some raised beds, what size and how many would you like? '.

Todmorden Learning Centre: Todmorden council decided the Todmorden Community College was too expensive to maintain. They planned to spend one million pounds knocking it down, tar sealing the site and giving it to Asda for carparking. IET didn't like that and though it's taken two years the building has now been asset transferred to the community. It will be turned into the Todmorden Learning Centre, an agriculture college, engineering workshop, fully equipped kitchen, rooms for hire, etc.

Police: The local Police station has edible beds. This time IET asked permission to build them. The Superintendent said 'if you ask me I'll have to ask division and they'll have to ask headquarters who will have to ask London and it will take two years'. IET stopped asking and went ahead. People love picking from the Police station beds, it's a popular place for photos.

Le Tour de Tod: The actual Tour de France starts in Yorkshire just 4 miles up the road from Todmorden in Hebden Bridge. However, as Todmorden is the first actual town in Yorkshire, the people of Todmorden think it should start there, so they started their own cycle tour: the 'Le Tour De Tod'. It's a mix of festival, parade with giant puppets, and a night time race where cyclists are lit up with LEDs.



Community spirit at a Sunday working bee



The banquet that happens after every working bee

2017 Study:

A 2017 report on IET titled 'Propagating Success' by Dr Adrian Morley of Manchester Metropolitan University, Dr Alan Farrier of the University of Central Lancashire, and Professor Mark Dooris of the University of Central Lancashire, reached the following conclusions with regard to IET's social return on investment (using the following criteria):

- Changed use of public space
- Greater physical activity and use of 'green space'
- IET used as a brand for business and tourism
- Buy local ethos promoted
- Increased engagement with food growing and wider food related issues
- Established learning and training opportunities for young people, wider community and marginalised groups

The resulting analysis showed a Net Social return for IET activities in 2016 of 878,609 pounds, set against inputs totalling 159,512 pounds. This results in an SROI ratio of 1 to 5.1: in other words for every 1 pound invested, largely through volunteer time and small financial contributions, 5.51 pounds was returned to the Todmorden community as a whole during 2016.

I spent 5 days in Todmorden and it was a unique experience. The community spirit was harmonious and palpable. The town felt vibrant socially and economically and there's no doubt IET has played a large role in making that happen.

All this because some tenacious and creatively minded people decided to start an edible garden in a unsightly public space, in a small town near Manchester, some 10 years ago.



Many kindness signs can be found around town



An edible bed in the town centre



Berry hedge in Todmorden town



Map of edible beds throughout the town

2. Repurposing marginal land and celebrating heritage:

Losaeater, Oslo, Norway.

Losaeater is an urban farm in the Bjørvika district of Oslo, Norway. You can walk there in a brisk 20 minutes from central Oslo - a picturesque walk that passes Oslo's famous opera house. Losaeater was founded by the infrastructure group Bjørvika Utvikling in collaboration with 'Future Farmers Arts Collective'. It's a project that combines art and food production. Bjørvika Utvikling has a regulatory requirement to fund public art projects as part of their infrastructure work.

Today Losaeater hosts a number of activities including a horticultural therapy project (awarded the national dementia prize in 2018) and an allotment collective. It has fields growing traditional grains, an abundance of vegetable plots, and a Flatbread Society public bake house (which is a sculpture in its own right and a gathering space). Visitors to the farm can participate in regular working bees and bread baking, hosted dinners and afternoon foraging, even art installations and lectures. It has been described as 'a cultural institution without walls' and the description rings true.

There are several notable events in the history of Losaeater:

1. Soil Procession. Losaeater is built on reclaimed land over a tunnel and as such there was originally little to no soil on site. A call went out in 2015 for organic farmers around Oslo to donate soil to the project. A highly symbolic 'soil procession' took place where 50 farmers wheelbarrowed their soil (well, some of it) through the streets of Oslo and out to Losaeater. This signalled the moment of transition from a marginal piece of land into a permanent stage for art and action related to organic food production. Once on site, the soil contributions were laid out and a 'soil declaration' was signed.



The site in 2012 / Photo Anne Beate Hovind



Soil procession through Oslo / Photo Joe Riley



Various soil contributions / Photo Joe Riley



Soil procession / Photo Joe Riley



Soil declaration being signed / Photo Joe Riley



Soil declaration being signed / Photo Monica Lovdahl

”With the establishment of Losæter at Loallmenningen, we mark our commitment to support and highlight agriculture as a central part of the Bjørvikas cultural landscape. We hereby declare Losæter a cultural commons. Losæter shall advance and contribute to the free and open exchange of seeds, knowledge, and relationships that grew out of this place. By signing this document, living traditions should be protected from any laws that interfere with these activities and that may be obstacles to the cultivation, distribution and future use of the biological material that grows on this land. The Flatbread Society Grainfield is an expression for this agreement. Unlike museums that collect and preserve works of art, The Flatbread Society Grainfield is a museum without walls that preserves through sharing and distribution.”

2. Bakehouse

A bakehouse at Losaeter was built in 2016. It is a project initiated by the Flatbread Society, a group of farmers, oven builders, astronomers, artists, soil scientists and bakers. The Flatbread Society is growing heritage grains on site with the aim to raise awareness of older more resilient grain varieties.

This from the Flatbread Societies website: 'The Bakehouse form emerges as an image of a vessel being built or repaired: scaffolding, clamps and the precarious angles of support beams evoke images of the past when this area was a port and stimulates the imagination in terms of what is to come. Bakehouses were historically used in rural Norway as a place of processing grains into flat bread as a way to store grain for the winter. Flatbread was baked in the shape of small, round discs with a hole in the middle and then hung in the ceilings of homes and bakehouses'.



Bread being baked during my visit



The bakehouse, a truly remarkable structure

3. Hiring of City Farmers

In April 2016 the first City Farmer at Losaeter was hired by the Norwegian Farmers Union in collaboration with Bjørvika Utvikling. Up to that point all input by the Future Farmers Arts Collective had been voluntary. In the spring of 2019 the 'Agency for Urban Environment - City of Oslo' took over funding for the position of City Farmer after seeing the success and popularity of the project over a number of years.



Meal being enjoyed after the weekly working bee



Me and City Farmer Øystein Hvamen Rasmussen

There is a consensus it has been relatively easy to get project funding for infrastructure items at Losaeter, but far more difficult to obtain funding for wages. There is also a recognition that more space and market opportunities are required to generate additional income in order to be less reliant on public funding. New projects are being pursued and one such in an adjacent hotel, the Hotel De Hub, is a good example. Here the City Farmers at Losaeter are growing vegetables on 250m² of roof space, as well as in the basement. The farmers lease the space at no cost and the hotel has a contract with them to purchase vegetables at market prices. The project is good for the hotel in many ways, not least including brand building - they have received a lot of positive media exposure for the project.

I spent a captivating day at Losaeter joining the working bee, interviewing City Farmers, touring the farm, and enjoying an evening meal of baked bread and farm produce.



Strawberry beds, Losaeter



Orchard, Losaeter

3. Tourism, employment, and maintaining traditions:

Andernach, Germany.

Andernach, 'the edible town' of Germany is a historic West German town of 30,000 inhabitants nestled on the banks of the river Rhine. Since 2008 an edible town project initiated by geologist Lutz Kosack (who works in the city planning office), and horticultural engineer Heike Boomgaarden, has seen food grown and animals kept in public spaces in the town.



Vegetable beds, Stadtburg castle



Heritage sheep in a park in Andernach town

Experienced growers work alongside the long-term unemployed to develop and maintain the gardens around town. Anyone is allowed and indeed encouraged to pick produce and tour the gardens, which have become a tourist attraction. The aim of the project is to promote healthy eating, connection to nature, and support the long-term unemployed with new skills. It is also about encouraging biodiversity, not least of all through the cultivation of less common heritage and regionally specific plants. Fresh produce and meat is sold for revenue, though the project is still heavily reliant on local government funding.

Each year a particular type of productive plant gets a special focus. In 2010, 101 tomato varieties were planted. In 2011 it was 100 varieties of beans, and in 2012, 20 varieties of onions. 2013 was the year of the cabbage. When I was there in 2019, it was the year of the hops.



2019 was the year of the hops, requiring tall and impressive climbing structures

Lutz Kosack informed me Andernach is part of a wider EU project to explore Urban Agriculture beyond so-called 'nice' community projects. Tours of the gardens started in 2010 (a total of 10), and 10 years later tours are up to 100 per year. Local operators have had to be upskilled in aspects of food growing so they can talk informatively about the gardens.

Despite initial concerns there has been no vandalism in 10 years.

Due to the success of the project the idea subsequently expanded into a 14-hectare peri-urban permaculture farm in the adjacent town of Eich. The permaculture farm offers employment and training for refugees, and generates revenue from the sale of meat and vegetables. A focus on growing heritage and regionally specific plants has enabled the farm to create a marketing opportunity for selling regional products.



The permaculture farm / Photo David Thorpe



Vegetable beds at the 14 hectare farm

The project has won several awards. The chairman of DUH (a German Environmental Help Foundation), Professor Harald Kächele, observed: “Urban gardening is currently in great demand in many cities in Germany. But the concept of Andernach is unique because it addresses all the cities' residents and beckons them to walk past the beds and sow and harvest themselves, and thereby change the cityscape in a positive way.”

Andernach is a picturesque town and has similarities to Incredible Edible Todmorden in that public spaces are used to grow food, however Todmorden is more of a local community grass roots approach, while Andernach is more of a municipality driven, top down approach.

Andernach – The Edible City

Activity range for citizens

Public parks are for everyone! Why are these parks only seen as an urban area but not as an activity range for the citizens?

Andernach breaks new ground with the idea of a multifunctional “edible city”, across new functioning to the public parkland, includes the witnesses, to campaigns for the living environment of their own city. The crop plant do not only afford to experience the seasons consciously, but also the natural stages of seeding, growing and harvesting.

A known example for the looking and picking, is the walnut. Likewise chestnut and almond purpose, and also crop plant like artichoke, potatoes, mango and green cabbage persuade with their beauty.

The idea of having regard to crop plants in public parks retrieves nature back into the city and creates new approach to a conscious, healthy nutrition. These plans are followed mainly by permanently unemployed person, who are instructed by professional gardeners. In this connection, the local company for education, qualification and integration, the “Perspektive Gönndel”, is responsible for coordination.

Permaculture

Create synergistic effects

Not only in the city, Andernach can be experienced as the “green city” in the district Eich inspires the project “living environment” with the construction of a 14 hectare great public permaculture compound.

Fruit and vegetable planting in consistent ecological cultivation means here the abdication of herbicide and mineral fertilizer. Instead of that catch crop in mixed cultivation is used, and also extensive mulching.

But also rare farm animal breed, like “Schwäbisch-Hällische” –hogs or the sheep breed “Coburger” –fox can be found here. By the way the products are offered for sale in the middle of the city (Hochstr. 53) for every citizen and guest at a very good price. In the case that the “edible city” is quickly harvested, healthy vegetables and fruits can be purchased like that at any time.

Picking permitted!

In Andernach they say “picking permitted” instead of “keep out”. Vegetables like carrots and beans, fruits, berries and trelis, culinary herbs or cut plants are planted in the green area and enable the appearance of completely new perceptual fields.

Every year one crop plant is focused particularly. Like in 2010 there were planted 100 sorts of tomatoes at the historical wall in the castle garden, in 2011 were planted 100 sorts of beans, in 2012 there were 20 sorts of onions, after the year of the cabbage, the strawberry, the pumpkin and the cereal, 2013 will be the year of the hop. In the near environments there is a small vineyard with grape variety to enjoy directly.

Especially the project facilitates the cultivation, of regional and rare sorts and strengthens thereby the identification with the home country and also supports the urban biodiversity. There is always room for vegetables and Co., as for example temporarily construction-gaps are used for plantings.

But there are further steps: The “edible city” is only one part of a modular and sustainable green space projecting. With the rearrangement of changing beds to easy-care shrub beds, the city combines ecological and economical advantages. To integrate particularly the younger inhabitants of the city into this project, a “mobile school garden”, was engineered, which can be positioned as required at mentioned schools or kindergartens.

Aspects of the edible city at a glance

- facilitation of cultivated plants variety
- demonstration of agrobiodiversity
- creating of new biotopes
- composition of multifunctional public parks
- city-climatic valorizing by greening-measure
- economical green-space-care
- activation of the citizens to arrange their own city
- integration of long-term unemployed person

Proceed yourself to a walking tour through the city, and let yourself fascinate by the special “green” in Andernach and perhaps directly select to a small taste.



A brochure in English details the project and maps locations of edible gardens in the town

4. Raising awareness and encouraging creativity:

Darmstadt, Germany.

Darmstadt is a city in the southern part of the Rhine-Main-Area in Germany, a half hour train ride from Frankfurt. It has a population of approximately 160,000 people. There are two urban farming groups in Darmstadt: 'Urban Garden Darmstadt' creates a mix of small-scale, creative, and collaborative projects to get people thinking about food production in the city; 'Initiative Edible Darmstadt', has built the state theatre gardens and the train station gardens, the latter a project combining food growing with artistic theatre.

1. Urban Garden Darmstadt:

A group of volunteers assemble most Sundays to maintain the vertical gardens at Herngartencafe, Hernegarten Park, Darmstadt. This sculptural project grows rare and unusual herbs in spouting which hangs in rows from steel frames outside a cafe. The cafe picks the herbs for culinary use in its dishes. Being located in the middle of a popular park, the garden is highly visible and has gained attention from passers-by. It is lit up at night.



The vertical garden under construction / Photo Initiatives Essbares Darmstadt



The vertical garden, 3 years on



The vertical gardens (roughly half)

Another Urban Garden Darmstadt project is both entertaining and whimsical, and very simple. In a suburb of Darmstadt, vegetables and herbs are planted in pots and placed on bollards. Local residents enjoy these so much they care for them, not least of all by way of watering which must be frequent in the summer months.



The whimsical bollard pots, Darmstadt

2. Initiatives Essbares (Edible) Darmstadt:

A collaborative approach is typical of the projects I encountered in Darmstadt. One project which demonstrates this is the State Theatre Garden. It is a collaboration between the State Theatre Company, Initiative Edible Darmstadt, a local nursery, and local residents. The Theatre Company supplied money for materials to construct planter boxes, a local nursery supplied plants, and Initiative Edible Darmstadt designed and built the garden beds.

Residents in nearby flats were approached and asked if they wanted to maintain the beds, of which several agreed. This is a common approach in Darmstadt and tends to work well in a place where apartment living and a lack of garden space often means people aren't able to access space for growing food.



State Theatre gardens / Photo Initiative Essbares Darmstadt



The State Theatre Gardens in July 2019



At another site near the central train station there is a garden filled with an abundance of vegetables and herbs. The Train Station Garden, managed by Initiative Edible Darmstadt, is an interesting blend of food growing, seed saving, artistic theatre, and recreation in the form of barbequing and drinking beer (a bar on site is run by a private enterprise working in collaboration with Initiative Edible Darmstadt). Theatre events take place around the theme of food growing and environmental issues, and the project has a general air of creativity with

site furniture built from upcycled pallets, plus a whimsical wayfinding sign. Seeds are saved (there's a storage facility), and events take place to raise awareness around seed saving. The Train Station Garden has been established as a green productive space that helps people connect to nature and it's very popular with locals.

This multifunctional blend of activities centered around food growing is common in Europe. A mixture of activities with different income streams helps ensure experimental food growing on a relatively small scale can be more financial resilient, meaning groups don't always have to go cap in hand to councils for funding.



Upcycled site furniture, Train Station Garden



An abundance of vegetables, Train Station Garden



Wayfinding sign



Potted green wall, Train Station Garden



Herbs on a street corner, Darmstadt

5. Commercial success and paying it forward:

PAKT, Antwerp, Belgium.

PAKT is a visionary and inspiring project located in former industrial warehouses near Antwerps Green Quarter, a mere 20 minute walk from Antwerps central train station.

Stefan Bostoën and his partners, İsmail Yaman and Yusuf Yaman, had a vision to create a creative entrepreneurial hub. After purchasing an industrial warehouse complex they started to enact their vision by building a rooftop farm. Stefan contacted Bram Stessels, a vegetable farmer and one-part of a four person farmers' co-operative (whose aim it is to get food production happening in cities) to get things moving. For one year Bram was paid 50% of full wage to conduct growing experiments on the rooftop, testing soil media and water management techniques. After a year of experimenting construction started in May 2017.

As construction advanced the rooftop gained media attention and creative entrepreneurs flocked to the warehouses to start businesses and lease space. Today there is a gym, a coffee roastery, restaurants at ground level, and many other businesses who call PAKT home.

Atop one of the buildings, three large glasshouses were cleverly constructed to increase production in what is a short growing season. These glasshouses are attached to load bearing points and designed to visually compliment the building. Stefans aim was always to invest in the vision of a rooftop farm and let that inspire and attract the right kind of people. There's no denying the advantage for businesses at PAKT being able to bring clients to the rooftop farm for meetings amongst the plants and gardens.



Glasshouses on top, restaurants at ground level



Bram Stessels on the roof



Inside one of the glasshouses

The business model at PAKT is varied. The farm operates as a CSA (community supported agriculture farm) with 100 members. Each pays 50 Euro per month for membership and in return Bram teaches them how to grow food in a one year internship program. Members have access to a community garden with individual plots, and they can pick from the common garden areas. There is a kitchen to use, seating areas, fire pits, a pizza oven, a sauna, and even a hot tub. The emphasis is on community, enjoyment, and a shared experience for all.

The internship program once concluded has a 'pay it forward' option. Membership fees can (if desired) reduce by 50% but there is a catch. This comes in the form of 'passing on knowledge learned', i.e. teach a monthly class to new interns. It's an innovative way of passing on skills

and in doing so Bram hopes he can move onto the next project before long - as he is simply not needed much anymore.



The community garden zone



Casual seating area adjacent glasshouses

There is also a commercial aspect to this farm. Twice a week vegetables are harvested and delivered to restaurants in Antwerp, including those at PAKT ground level.

Growing techniques are innovative, though in a determinedly low-tech way. That's the focus here, to make solutions low-tech and using widely available materials so you have a model within reach of the ordinary person.

Engineers determined what loading the building could take - only 200kg per metre² across most of the roof area. To get around this Bram built raised beds along the edges of the rooftop which could take more weight. These raised beds are innovative and function in two parts: an upper plastic tub containing plants and growing media, and a lower tub that collects water (the tubs are recycled too). A geotextile runs from the lower to the upper tub, whose function it is to transfer water passively via capillary action. It's smart and so very simple. The tubs are covered in polythene and finally clad in a rustic wooden paling. These outer layers prevent direct sunlight hitting the water, deterring algal growth.

A massive 100,000 litre water tank is buried at ground level. Rainfall makes its way through garden beds, and various membranes before eventually finding its way into the tank. This is then pumped back up to the roof to irrigate when necessary. The need for watering is lowered by using seeds saved from plants grown at Lanzarote island (a Canary island off the coast of West Africa), which have evolved to cope with a low water requirement and high wind.



Recycled plastic tubs as raised beds at the edges



Raised beds with paling facade + a new classroom

Compost is added to vegetable beds. Bram emphasises the need to constantly add fertility as beds are not particularly deep or connected to any subsoil. Haybales are also used for growing. They are ideal for rooftops as they are lightweight, relatively cheap and readily available. Their carbon to nitrogen ratio is such that once water is added they heat up over a period of ten days - rising to 60/70 degrees C before coming back down to 20 C, at which time compost can be inserted and vegetables planted.



Haybales are light, cheap and plentiful



There are also chickens on the rooftop

There is even an aquaculture system. Watercress grows in lightweight clay balls above large tubs containing carp. Water is circulated through the watercress, into the tubs containing carp, then pumped from the tubs back through the watercress. It's a simple circulating system in which manure from the carp feed the plants and the watercress helps filter the water. The carp are also vegetarian and restaurants at ground level feed food scraps to them.



One can move from rooftop to rooftop by way of bridges.

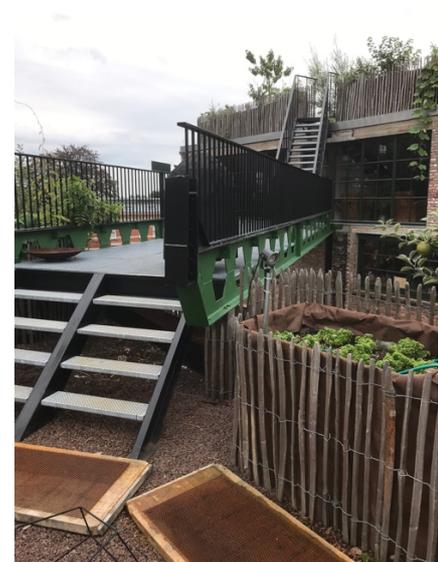


The aquaculture system

A visit to PAKT was confirmed last minute and involved two 10-hour train journeys in 2 days. It was a difficult schedule but one I'd do again. Here is a project combining commerce, community and creativity, in a visually impressive way.



Market stall at ground level, PAKT, Antwerp, Belgium



Bridge between buildings

6. Transforming wasteland, strength in diversity:

Le Talus, Marseille, France.

Le Talus is a one-hectare urban farm in the southern French city of Marseille. As described in the farms' website, Le Talus is 'An old wasteland transformed into an associative urban farm designed as an open-air laboratory for ecological transition'.

Carl Pfanner, the co-creator and manager of Le Talus farm describes Marseille as a neglected place that doesn't enjoy the same kind of financial support from council and government that wealthier French cities enjoy. Because there is a constant lack of money and public funding nothing functions that well. Into this vacuum however an interesting and lively culture exists where the attitude is 'anything is possible'. In simple terms, people have to make it happen (or it won't).

One positive is a legal structure called 'Association' that dates back to 1901. It allows organisations with non-profit status special protection - public and private donations are tax-deductible. The use of this special status is very active in Marseille and it helps replace a lack of funding from public bodies.

It took Carl two years to find a location for Le Talus farm. It was a difficult process finding land not under pressure from development or contaminated in some way. Eventually land was found that had been used for 70 years as a construction site housing large machinery, offices, and accommodation for road workers. It was a wasteland littered with rubble and broken concrete. Carl approached the company responsible for the land and presented them with a plan for an environmental, social, and economically sustainable project. His background in business helped him put together a compelling case. Consultation took place with local government and nearby residents, and an initial 6-year lease was signed (at no

cost). A huge amount of rubble was removed from site and the soil was built up to a level today some 1.5m higher than it was in 2016.



The site in 2016, a wasteland of construction rubble
Photos www.letalus.com



A digger clearing the site in 2017

The business model and range of activities at Le Talus is diverse. There are 116 raised beds, each rented at a modest one Euro per week, with 800 more to be built in an expansion project on adjacent land (there is high demand). In the growing areas, the focus is on salad greens (150 bags are picked each week), though a range of other vegetables are also grown. There is an outdoor kitchen run by refugees with meals prepared one evening a week (50% of ingredients coming from the farm). Workshops occur on everything from paper making to keeping bees, tree planting, and making upcycled furniture. 1500 people pay six Euros each a year to be part of the 'Association' - they're all connected to the farm in some way.

A bar on site is the most profitable part of the farm and Carl makes it clear that the farm could not survive in its current form without it. One evening I was there meals were being served, beer was flowing, and a DJ was playing. This isn't your ordinary farm. This kind of scenario is not exclusive to Le Talus though, urban food production and hospitality go hand in hand in Europe, though this was the liveliest set-up I witnessed. You could say it fits Marseille perfectly. What helps make this lively and occasionally very loud approach possible is the farms location in an industrial area, with nearest residents some distance away.



Overview of Le Talus farm late summer 2019 with covered seating area in the foreground

Ten people are employed full-time at Le Talus and move between different roles and activities. The farm is part of a special program where long-term unemployed are paid 681 Euros per month (573 Euros coming from Government, 108 Euros from Le Talus) to be supported into new skills and full-time work. It's a 6-12 month program with new internees constantly coming and going. Le Talus received 200,000 euros per year in external funding between 2016 and 2019 (a figure that includes the long-term unemployed wage subsidy).



Carl Pfanner



Seating areas, outdoor kitchen and bar



The farm's composting toilet

The main challenge Carl now faces is one of management. It's a constant juggling act to stay on top of every activity. I think he's doing a great job with a project that's a successful example of how to transform a wasteland into a productive community-orientated farm.

7. An effecting vision and applied research:

AgroParisTech, Paris, France.

In 2014 the Mayor of Paris announced a pilot project ‘Parisculteurs’ in response to a lack of green space in the city. The idea was to green Paris by creating 100 hectares of green roofs and walls by 2020, of which 1/3 would be dedicated to Urban Agriculture. A team of experts was assembled to identify 40 sites across Paris with favourable attributes (assessment criteria included susceptibility to flooding, rooftop loading, ease of access, etc.). An initial call for project partners saw 126 applications received and 33 selected. The city of Paris provided various funding amounts, depending on whether the project was located on council property or had a commercial or social focus. Parisculteurs is widely regarded as a successful model led by a city municipality, and has been a catalyst for the growth of urban agriculture in Paris.

AgroParisTech is a horticultural training centre in Paris and one of the Parisculteurs project partners. The centre established an experimental rooftop farm in 2012 to test techniques of growing on rooftops. Soil mixes were trialed to test the suitability of a rooftop scenario where weight and loading are of critical importance. The most successful soil mixes used a combination of clay balls, coffee grounds, fine wood chips and green manures in raised boxes. Good yields were achieved in an environment some 3 degrees hotter on average than at ground level. The weight of these boxes averaged 350kg per m² (acceptable for this rooftop) though every building requires its own assessment.



AgroParisTech rooftop. Photo by Aeromate



The RATP/Aeromate Parisculteurs winning project (not one I had time to visit) Photo by Aeromate

8. Education, nature connection, and changing hearts:

Vene Verdi, Paris, France.

Vene Verdi is an organisation supported since 2016 by the European Social Fund to develop micro-farms in Paris, France. Their focus is working with schools to create awareness from an early age of nature, the environment, biodiversity and the challenges of food production and supply. The garden is seen as an optimum place for discovery and a place to learn co-operation, sharing and help address social issues - including students dropping out of school (a major problem in some of the poorer neighbourhoods of Paris). Vene Verdi sells its produce at market stalls and has benefitted from the research done by AgroParisTech.

I visited two Vene Verdi sites in Paris, the first a rooftop garden at Centre EDF School, 18th arrondissement. School students have their own garden space and Vene Verdi teaches them how to grow food. Plants are donated by a nursery and the school provides funds for much needed materials. Seeds are saved and the entire rooftop is netted to protect from birds. Pathways are thickly mulched (mulch is placed directly on the roof surface), and raised beds are constructed using lightweight clay balls. There is an old toilet shed on the rooftop used for seed raising. I was impressed with the level of passion shown from the gardeners and interns at Vene Verdi. I had a sense they really treasured their time here, in a city with a recognised lack of green space and few opportunities in which to grow food.



Interns on the rooftop



Seed saving



The EDF school rooftop



Raised bed making

The second project I visited was the Pierre Mendez France School in the 20th arrondissement. It is located in a low socio-economic area that welcomes children in difficult social situations. This project has been successful in limiting early school leaving: in 2.5-year period some 30 students could be ‘caught’, i.e. prevented from leaving and kept in school. Students learn they can be creative and productive with their hands while gardening, and it can be fun.

Pierre Mendez school had been plagued by incidents of violence, and parents in the local area were refusing to send their children there. A new principal took over in 2014 and initiated a series of extra-curricular programs which included Vene Verdi planting food gardens on school grounds. Vene Verdi also set up a creative project inviting students to explore how plants come to life through animation.

As of 2019, the school now has most of its grounds planted out in edibles and food crops. They have made their own open air drier for herbs, they keep chickens and rabbits, have a tunnelhouse, flower gardens, and a Mediterranean garden. Subjects such as ‘Life and Sciences’ have integrated gardening into the curriculum.

One particular story shared by Vene Verdi gardener - Louiz Grall-Vigneron - struck me in terms of its impact. A violent incident at the school led to a student almost being expelled, but instead he was sent to work with Vene Verdi in the school gardens for 2 months. He talked and shared his feelings regarding his life, his home situation, etc. He received a lot of attention in these 2 months. He was given his own project building a seat out of recycled timber, and he spent time caring for the animals at the school. His behavior changed and he stayed in school.



Louiz shared inspiring stories



The seat built by a student who was almost expelled

As a result of these programs, for the first time in 2019, parents from outside the school zone have enrolled their children. Some students have even chosen landscaping as a vocation, and are given responsibility to share their knowledge with volunteers who regularly come to help. This visit for me demonstrated the potential of a garden, due care, and compassionate attention in the ability to change lives.



Vegetable beds at Pierre Mendez School



The air drier



Herbs drying in the sun

9. An ingenious business model:

Allotments Under Glass, Almere, Netherlands.

‘Allotments Under Glass’ on the outskirts of Almere city, Netherlands, is a unique approach to community gardening and an inventive business model. In 2012 flower grower Ron van Zwet, facing reduced returns due to increased competition from imported flowers, converted his large glasshouses to a new enterprise: ‘Allotments Under Glass’. The concept is simple: people can rent 3 x 4m plots inside 3 large glasshouses at a cost of 23 Euro per month, and all growing must be done using organic principles. Each plot has a water tap and people have access to a retail shop where excess produce can be sold. Ron supplies compost (inclusive) and building materials for fences and climbing structures. There are toilet facilities and a common sitting area. Pest control is also done by Ron (e.g. the parasitic wasp *encarsia formosa* used to control whitefly) and seedlings are available for purchase.

The glasshouses are well occupied and popular with migrant / refugee communities, largely because of what can be grown. Almere has cold winters where the ground freezes but inside the glasshouses it’s milder. In summer it gets so hot exotic crops like bitter melon, tropical aubergine, antroewa, bitawiri, and corn from Surinam can be grown, helping migrant communities stay connected to their cultural roots with regards to food traditions.

A real spirit of co-operation exists amongst community gardeners here, with people sharing produce and making arrangements to grow specific crops for exchange.



Incredibly lush and well-tended garden plots at Allotments Under Glass



The shop where excess produce is sold

10. Access to local food and a peri-urban example:

PLUK CSA, Amsterdam, Netherlands.

PLUK is a 100 member CSA (community supported agriculture) farm in West Amsterdam, a 25 minute bike ride from the city centre. It was started by the urban farming collective CityPlot at the beginning of 2017. The objective of a CSA farm is to connect people with growers directly and promote access to fresh local food. CSA's are typically smaller in scale compared to large commercial farms and are fairly common in Europe.

PLUK consists of 4-5 acres of fruit trees including cherries under canopy, pears, apples, and berry varieties. Several tunnelhouses are used to grow vegetables in an extended growing season, and field vegetable growing occurs on low flats adjacent a stream. There are free range chickens and a special breed of pig that forage but do not dig up the ground. The gardens are managed organically and with hand tools where possible.

Rather than calling people consumers, PLUK refers to their members as 'harvesters'. PLUK is open 3 days a week for harvesters to pick produce (it's a pick your own scenario) and garden if they want to - but they are not obligated to do so. A number of volunteers garden at PLUK regularly just for the opportunity to connect with nature and community.



Eva, a member of CityPlot, next to a table containing a mornings harvest from the adjacent tunnelhouse



Vegetable field growing at PLUK CSA

The farm employs 3 full time growers on a small living wage. This type of work is not well paid in the Netherlands and so members of the CSA are offered the opportunity to pay for produce via a sliding scale - pay a little more if you can afford to in order to help support the growers. Despite not making huge amounts of money, PLUK operates profitably and independent of grant funding. PLUK is situated adjacent an organic shop and cafe through which it sells organic juice from abundant fruit trees on the farm.

PLUK is a vibrant farm with a real sense of kinship between growers, and a great example of how city dwellers can access fresh local food direct from the farm without having to travel too far.



Pigs and chooks happily co-habit under cherry trees An evening with CityPlot Amsterdam crew



Tunnelhouse at PLUK CSA



View of a berry growing area

11. Fine dining and a unique rooftop farm:

OsterGro, Copenhagen Denmark.

OsterGro is a rooftop farm and bespoke restaurant in Copenhagen's Klimakvarter - a 'climate-resilient' neighbourhood. It was started in 2015 by Livia Urban Swart Haaland and Kristian Skaarup in response to the call for a climate friendly project atop an old car-auction house. Livia and Kristian had been working together on a community garden project at the old Carlsberg brewery site in Copenhagen. They both had a passion for urban food growing.

In 2007 the Klimakvarter was subject to an adverse rainfall event which resulted in a massive flood; there had not been enough green space or stormwater mitigating strategies to absorb the amount of rain that fell. The idea of a rooftop farm was partly in response to this event. Soil holds rainwater and slows down its transition to the stormwater system, which helps prevent it from being overrun. Another motivation was to create a place for education; to build a mini-farm replicating field growing techniques and using organic methods, close to schools and residential areas. The rooftop was originally built to take the weight of 25 cars, so loading is not an issue. Garden beds consist of a hefty 35cm of soil over a geogrid system that holds water. Excess water is delivered to a rainwater tank on the roof.



*Overview,
OsterGro
rooftop farm,
Copenhagen.*

OsterGro operates as a CSA with 40-member families coming once a week to harvest and lend a hand. Volunteer day is Wednesday, when 20-25 people arrive to help out and learn about growing. At 1pm a lunch is made and everyone eats together. Some volunteers have been coming for years. The CSA operates in co-operation with the Seerupgaard farm in Dragør, outside of Copenhagen, which supplies additional produce when needed.

There is a restaurant 'Gro Spiseri' on the rooftop. It's open five evenings a week for two sittings, at 5.30pm and 8.30pm. Twenty-five people are seated in a long table and a six-course menu is served. The restaurant is the backbone of the OsterGro economy and it's almost always booked out. Specialising in a kind of Nordic style food, it serves fresh ingredients with lots of greens, meat in season (rabbit, cod, mussels and oysters while I was there), and only uses 10% of food grown on the rooftop in its menu (90% is sourced from outside farms). This is a common misconception with diners who assume all vegetables served come from the rooftop. Part of OsterGro's mission is to educate people about what it takes to produce food, what goes into the growing, transportation, and preparation. In December and January the restaurant reduces to one sitting a night and it closes completely in February. It's pretty cold by then and the gardens aren't producing much at all.



Restaurant long table



Garden beds

In full season OsterGro employs four people in the office and gardens, four full-time chefs, one part-time chef, one part-time front of house and one intern. One person is also employed to manage the CSA at 80% of full time. OsterGro supports many people and extra sources of income such as venue hire for weddings, workshops, and school visits all helps.

OsterGro received significant start-up funding from the Copenhagen municipality, with 400,000 DKR (100,000 NZD) in two separate grants. It also received money from Realdania, an investment fund with billions of \$ in real estate who provide support for new architectural projects. Money also came from the National Organic Organisation, who have an interest in bringing farming to urban areas. The project operates day to day independent of any grants or foundation money, something manager Steffen Kristensen is keen to point out. Steffen is now looking to start up other projects in Copenhagen. One is in the historic Meatpacking district above a restaurant (no surprise there). It's opposite the largest drug management centre in Copenhagen where users can resource clean needles and seek help. This next project aims to involve ex-users and help them re-integrate into society.



Inventive seats that can be wheeled around



Chicken coup on the roof

OsterGro is an example of how hospitality and urban farming can be successful partners, with one supporting the other. It is also a visually impressive project, where due consideration has been given not just to how a space functions, but to how it looks as well.

12. Micro-farming and microgreens:

Le Paysan Urbain Marseille, Marseille, France.

Le Paysan Urbain (The Urban Peasant) is an organisation creating agro-ecological urban farms and using them as an economic activity to help disadvantaged people into stable work and housing. The Marseille site, founded in 2018, is a micro-farming operation situated on the land of a Catholic foundation and monastery (compagnons d'Auteuil).

At La Paysan Urbain Marseille they grow micro-greens, edible flowers and herbs. A small rent is paid to occupy the site in exchange for looking after and beautifying the monastery grounds (planting flowers, mowing lawns, etc.). The monastery operates an independent fine dining restaurant 'Le Cloître', to which Le Paysan sells its produce. It's a win-win situation.



The monastery / Photo Google earth



My outstanding host, Guillaume Morel-Chevillet (on the left) and Benoit Liotard (La Paysan Urbain founder) at the monastery restaurant

Le Paysan Urbain is in partnership with government and industry to work with disadvantaged youth. Government pays the salary of youth who work at the farm for a maximum of 2 years. Youth work in a range of areas including horticulture, administration, business, and construction, with the goal being to discover what each persons' interests are and focus their learning in that area. Every 3 years funding is reviewed and ongoing support is dependent on

the number of people who have transitioned into stable long-term work. There is also a social worker engaged part-time who helps youth employed at the farm find stable housing - an issue that often needs resolving.

The Marseille site is still in the process of establishment. It has received money from various French foundations such as banks and insurance companies with funds available for urban agriculture. As of August 2019 the farm was earning 4000-5000 Euro per month in sales, with the eventual aim of 10,000 euro per month. It's an impressive result considering the farm had only been operational 6 months at the time of my visit. This is no doubt due to Benoit Liotard's prior experience at the Paris operation. The eventual goal is 100,000 Euro per year from sales. The whole enterprise costs 300,000 Euro per year to run with 100,000 Euro coming from Government and a further 100,000 euro coming from foundation grants. There is a large dependency on foundation grants and Benoit would like to reduce this dependency.



The microgreen tunnelhouse

My guide for the day, Guillaume Morel-Chevillet (who worked on the Pariscultuers initiative) informed me the La Paysan Urbain Marseille project is leaning towards what is called 'social insertion' in France. Rather than explicitly focused on food production, Urban Agriculture is the means through which a social program can operate.

13. Waste reduction and a circular economy:

La Boite a champignon, Paris, France.

Upcycle is a company founded in 2011 by Cedric Pechard on the principle of recycling organic waste from cities, in a move towards a more regenerative circular economy.

Practically, this principle has been turned into a business that recycles some 20 tonnes of coffee grounds per month from restaurants in West Paris to grow oyster mushrooms.

The process: recycled coffee grounds are mixed with woodchips and put through a specially designed pasteurizing machine, which pumps in steam while mixing at over 100 degrees C.

This mixture is then impregnated with oyster mushroom mycelium and put into plastic bags.

The bags are placed in a temperature controlled dark room for roughly 2 weeks, in order to mimic a forest environment. It is very important at this stage to avoid cross-contamination with other fungi, and I must wash hands and put on a lab coat before entering the room.

After a fortnight the bags are moved to a second room where conditions do not have to be as sterile. Lights are turned on, humidity is reduced and cuts are made in the bags. The mushrooms, feeding on cellulose in the woodchips and coffee grounds, grow out of these cuts. Due to being 'stressed' they grow quickly and can double in size in a single day. Two harvests are possible from each bag but the quality declines.



The first 'incubation' room



The second room with mushrooms growing

At the end of the process the waste product / used mixture is sold to market gardens as compost (it has a good mineral composition), though it must be dug into the soil or the mycelium will form a hard crusty layer. The objective over time is to eliminate the use of plastic bags but experiments so far using compostable bags haven't worked as they are also made of cellulose and the mushrooms simply eat their way through. It's a work in progress.

This process also produces mushrooms with a low water content, making them ideal for restaurant use. It was encouraging to see a waste product that might otherwise end up in a landfill going to good use.



A small boxed product



Used mixture ready for market gardens



Another arm to the business is this compost unit, sold to municipalities in France and abroad

14. Herbs and beauty:

Rotterdamse Munt, Rotterdam, Holland.

Rotterdamse Munt is the result of an experimental residents' initiative in 2014 to create inspiring and educational gardens on a wasteland site in the Laan op Zuid area of Rotterdam. In 2018 the project moved to a permanent location above a railway tunnel in the Rosestraat area of Rotterdam (the municipality provided the land). Initially the focus was on growing herbs, but the gardens have since expanded to include edible flowers, leafy greens, vegetables, an online shop, and a restaurant. The restaurant, glasshouse, and outdoor spaces can be hired for activities like meals, meetings, breakout sessions, and corporate team days.



The central glasshouse and seedling tables



Herb beds neatly laid out

Rotterdamse Munt is a diverse operation and enjoys regular visits from schools and volunteers. Workshops are taught on everything from painting to toy making and food growing. Herbs and seedlings are available for sale. One of the main initiatives is a 'workfit in green' program: helping long-term unemployed with training and life skills, and in taking the next steps to reintegrate with the labour market. It's a holistic program that addresses the whole individual and workfit coaches are assigned to each person. Participants are encouraged to ask questions of themselves like, 'what do I enjoy doing and what do I want to achieve in the future?' or 'what do I find difficult and how can I learn to deal with it?'. Participants are coached to improve communication skills, build self-confidence and

positivity, learn to work together as a team, and learn how to handle assignments and instructions. The program is open to people receiving a benefit and the state pays Rotterdamse Munt a fee per person.

The farm also has professionals visit one day a week to garden (they pay a fee and are coached in gardening). These are many interconnected parts of a project that is financially independent - Rotterdamse Munt does not rely on grants to be financially viable. Rotterdamse Munt is also led by a Landscape Architect, and it isn't hard to see how the design of exterior space has been an important part of the establishment process.



The restaurant at Rotterdamse Munt



Inside the central glasshouse



More herb beds, Rotterdamse Munt



15. A Netherlands Perspective:

Interview with Dr. Jan Willem van der Schans

Wageningen Economic Research, 2502 LS Den Haag, Netherlands

On 23 July 2019 I travelled to the Hague to interview Dr. Jan Willem van der Schans who has a role with the Wageningen Economic Research Institute in the Netherlands (formerly the Agricultural Economics Research Institute). Dr. Jan Willems role is in 'Short Innovative Food Supply Chains'. He has a background which includes advising local councils and government on town planning issues with regard to livable cities, food security and urban agriculture. He has been instrumental in numerous urban and peri-farming initiatives in the Netherlands, and has published work regarding urban agriculture in the Netherlands and greater Europe.

The following is a summary from my conversation with Dr. Jan Willem.

The Netherlands is a major food producer and exporter, much of which occurs as through-put via the Rotterdam port (the port acts as a distributor taking produce from one country and delivering to another). The country has large areas of highly technologically developed greenhouse production. Previously the heating of greenhouses in the Netherlands was done using natural gas, however this has now transitioned to the use of solar energy. Solar energy is captured and stored in water reservoirs 3km underground then pumped back up again for use during winter. CO₂ from the port area is also 'cleaned' and fed to plants inside these greenhouses (CO₂ levels inside the greenhouses are higher than those outside), which enables the plants (tomatoes for example) to grow faster.

In the south of Holland there exists significant problems with processing excess nutrients from dairy cattle, as well as problems with methane and ammonia output. The south has poor soil and was historically developed into intensive animal agriculture as it was not suitable for horticulture or arable farming. This was only made possible due to the following reason: when the EU was formed tariffs were placed on agricultural goods, however Rotterdam port negotiated a special 'tariff free zone' which meant they could import cheap unprocessed soybean shreds as animal feed. This enabled the growth of intensive animal farming in the south.

Urban agriculture in many developing countries is driven by the need for food security, but in the Netherlands this is not the case. If the food distribution system in the Netherlands was to break down through any kind of disaster scenario, it would be faced with a massive excess of food - for this reason urban farming in Netherlands cannot be justified under some kind of disaster scenario. A disaster for the Netherlands would be if they can't sell their excess tomatoes (for example).

The Netherlands is roughly the same size as greater Paris, but it doesn't have the same kind of 'nature deficit' issue as does Paris or other European cities with a distinct lack of green space. The Netherlands has 'green belts' around their cities which are a combination of food production, recreation and biodiversity. Farmers in these areas are paid subsidies through the European Union common agricultural policy so they can hold onto their land and keep farming. One condition however is they must open up areas to the general public for access (walking and cycling paths for example). These green zones sometimes include 'agri-parks' - some 200 hectares of peri-urban land close to major airports which cannot be developed due to planes taking off and landing. The agri-park near Amsterdam has numerous farming

experiments occurring, including an operation combining apple orchards with free-range chicken farming. There are agri-parks throughout Europe including near Geneva and Milan.

The thinking in the Netherlands - at least with regards to Rotterdam (which was completely destroyed at the end of WW2 and rebuilt) - was to have develop dense cities with very green infrastructure, e.g. skyscrapers and urban farms. The idea being the city becomes dense and attractive and the countryside is left for growing food. Simply put, cities with a lot of green infrastructure are much nicer cities to live in as there is better temperature mitigation (e.g. cooling in summer), better flood mitigation (urban agriculture soaks and stores rainfall), and space to grow food and interact with nature.

Price pressure for produce in the Netherlands is continually downwards due to excess production, and it is recognized that farmers are not particularly well paid. This affects urban agriculture as few people will pay a premium for vegetables grown on a rooftop for example, when there is an abundance of cheap produce in the supermarkets. There is also no special gearing towards the local food system. This means urban farming is often done for social reasons, e.g. addressing unemployment in the city or work preferences (not everyone can or wants to have an office job).

Major exporting and importing in the Netherlands is based on bulk commodities, including common varieties that store very well and have a long shelf life (e.g. fruit varieties with very thick skin or fruit picked unripe / partially ripe that is later gas ripened before sale). Converse to this, urban agriculture has an opportunity with regards to specialty vegetables, e.g. heritage varieties, particular flavour, higher nutrient value, picked close to actual ripening, etc. People get excited with this kind of ripe delicious produce which also brings opportunities for

education around the origins of food and how it is grown. This type of produce might be expensive to purchase but an urban farm can be geared towards high end consumers subsidising the low-end market - which might have access to lower priced produce or to actual gardens workshops for growing food.

In the USA and Canada this kind of specialization in urban agriculture is being somewhat corrupted since the legalization of cannabis - people are now growing cannabis for profit in greenhouses in cities and that's where the investment is going...not so much feed the urban poor anymore.

16. Additional Projects Visited:

Versailles / Merano / Clapham Junction

I also visited a number of other projects that have been excluded from in-depth analysis in this report. This is a summary as to where and why:

Versailles (France): Le Ferme de Nature & Decouverts (the nature and discovery farm).

This small permaculture farm in Versailles adjacent the central railway station was in the process of establishment when I visited. Several buildings under construction were to be used for educational workshops / spaces to rent. Ponds were being dug and many gardens were being created. This project is being funded by a multi-national eco-business organization building a new headquarters next-door. The most interesting aspect of this farm is perhaps the history of the site - it used to be a water reservoir for the palace of Versailles. Water was stored here and sent to the palace some 2km away via gravity and an underground piping system. Due to the project being under establishment and it being similar to other projects visited, I did not elaborate in more detail in this report.



Some gardens are already established and buildings were under construction when I visited in 2019. This rear stone wall was part of the water reservoir for the palace of Versailles.

Merano (Italy): Walters permaculture farm and orchard.

This was an interesting permaculture farm / orchard on the outskirts of Merano in northern Italy. It had some interesting learnings from a management perspective (in terms of organic orcharding). However this was very much in a rural location and did not fall into the category of urban agriculture.



Walter and the clever ladder he has developed. *Walters permaculture farm in the hills above Merano, Italy.*

Clapham Junction (London): Growing Underground.

This very unusual urban farm is located in several old bomb shelters built during WW2 and located under the Clapham Junction northern tube line in London. It grows microgreens in a 100% artificial environment, i.e. artificial lighting and soil-less media (microgreens are grown on recycled carpet). The farm is a sterile environment (lab coats and hair hats must be worn) and air filters are required to keep the air clean. Large quantities of water is used daily for washing down surfaces, and a large amount of plastic waste is produced as a by-product of the growing operation. This fledgling business has been made possible largely due to several successful crowdfunding campaigns, and the London underground company leasing

the shelters at a very low cost. These old shelters were actually used to house immigrants who came to London after WW2. Though it is a very innovative project, I did not elaborate on it as (in my opinion) this is such a unique and artificial growing environment as to be almost impossible to replicate, especially when there are opportunities for growing above ground. Perhaps only in a place such as London or another highly densely populated city could such a project be feasible.



The growing Underground microgreen farm, and seedlings growing on recycled carpet.

Appendix 1: Travel Diary

Date / 2019	Who / where	Experience
10 / 11 July	<i>Andernach, Germany</i> Meet Dr Lotz Kosack / office for urban planning and urban development.	Discuss urban sustainability and Andernachs' edible gardens project in public spaces. Tour the gardens, document findings.
13 / 14 July	<i>Darmstadt, Germany.</i> Meet Jessica Grove-Smith of the Passive House Institute and member of Urban Garden Darmstadt.	Discuss urban food growing initiatives in Darmstadt, tour sites in the city, and document individual projects.
17 July	<i>Paris, France</i> Meet Anais Franc of Vene Verdi the Le Centre EDF school.	Visit the schools rooftop gardens, discuss the project, and help build a raised bed and save seeds.
17 July	<i>Paris, France</i> Meet Christine Aubry, INRA Consultant Professor at AgroParisTech.	Discuss urban farming initiatives in Paris and Marseille, visit the experimental rooftop farm at AgroParisTech.
18 July	<i>Paris, France</i> Meet Louis Grall-Vigneron of Vene Verdi at Pierre Mendes School.	Visit the schools extensive gardens, discuss the project at length and document findings.
19 July	<i>Versaille, France</i> Meet Gille at Le Ferme de Nature and Decouvertes permaculture farm.	Visit the permaculture farm and discuss its inception and development. Take photos.
19 July	<i>Paris, France</i> Meet Camille Dobler, responsible for research and development at La Boite a Champignon mushroom farm.	Tour the laboratory and production facilities, document and photograph findings.
23 July	<i>The Hague, Netherlands</i> Meet Dr. Jan Willem van der Schans. Expert in Short Innovative Food Supply Chains, Wageningen Economic Research, The Hague.	Interview Jan Willem on urban agriculture in the Netherlands: history, context, development, and findings from built projects.
24 July	<i>Almere, Netherlands</i> Meet Jan-Eelco Jansma, Program Developer at AMS institute Amsterdam and PHD Candidate at Aeres University of Applied Sciences.	Tour two projects, the Almere Allotments Under Glass, and Oosterwold residential urban development. Discuss, document and take photos.
25 July	<i>Amsterdam, Netherlands</i> Meet Eva of the Amsterdam Urban Farmers Collective, 'CityPlot'.	Tour projects in the city including community gardens, and a CSA farm, meet local farmers and discuss various projects.

26 July	<i>Rotterdam, Netherlands</i> Meet Wouter Bouman, nature and spatial planning consultant at the Rotterdam Environment centre and manager of Dakakkar rooftop farm.	Walk the rooftop farm, discuss its design and construction, join a working bee, document findings and take photos.
26 July	<i>Rotterdam, Netherlands</i> Visit Rotterdamse Munt and meet (briefly) founder and landscape Architect Ingrid Ackermans.	Walk the gardens and discuss with the garden manager, observe the design and layout, document and photograph.
31 July	<i>Marseille, France</i> Meet Guillaume Morel-Chevillet, urban agriculture researcher, and Benoit Liotard, founder La Paysan Urbain Paris and Marseille.	Interview Benoit and Guillaume at the La Paysan Urbain Marseille site. Walk the site and take photographs. Enjoy a meal from the Monastery.
1st August	<i>Marseille, France</i> Meet Carl Pfanner, manager Le Talus community farm.	Interview Carl, walk the farm, enjoy a meal from the farms open air restaurant.
7 August	<i>Merano, Italy</i> Meet Walter Margesin, permaculture farmer and orchardist.	Visit Paulwirter permaculture farm just outside Merano Italy, interview Walter and discuss his growing methodologies.
15 August	<i>Antwerp, Belgian</i> Meet Bram Stessels, vegetable grower and co-manager of PAKT.	Interview Bram and tour rooftop farm PAKT, document findings and take photographs.
18-21 August	<i>Todmorden, Yorkshire, England</i> Meet Estelle Brown, and Mary Clear - co-founder of Incredible Edible Todmorden.	Interview Estelle and tour the town with her, join the Sunday meal, meet volunteers, stay for several days documenting projects around town.
28 August	<i>Oslo, Norway</i> Meet City Farmer Øystein Hvamen Rasmussen of Losaeter farm.	Tour Losaeter farm, meet the volunteers, interview the City farmers, join a working bee and enjoy a traditional meal.
2 September	<i>Copenhagen, Denmark</i> Meet Steffan Kristensen, project manager for OsterGro rooftop farm and restaurant.	Interview Steffen about the project and how it is managed and sustained. Walk the rooftop, document and taking photos.
7 September	<i>London, England</i> Tour Growing Underground, subterranean micro-farm.	Take a group tour of Growing Underground, a microgreen growing operation in WW2 bomb shelters under the London underground Clapham Station.

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